

Product 810

DATA FOR 2025 (in progress)

"Product 810"



Long-range air-to-air missile. Developed by the Vympel State Design Bureau using developments on the K-3Z missiles. As of 2008, work was underway on the missile's preliminary design. Probably, in 2010, the preliminary design of the missile itself and some of its elements (for example, the Orlan product - see below) was defended. Completion of the development is planned for 2013 (*source - Based on the report*). According to articles on the work of the Chkalov State Flight Test Center in Akhtubinsk, in 2014-2015, it was planned to test the product 810 missile at the State Flight Test Center.

In 2019, during a visit to the Vympel Design Bureau by the Moscow leadership, a sample of the product 810 missile body was shown.



Model of the rocket "product 810" (<https://otvaga2004.mybb.ru/>, 2024).

Author: DIMMI

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Comments: 1

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K-37 / R-37 / RVV-BD - AA-13 ARROW

DATA AS OF 2017 (standard replenishment)

K-37 / R-37 / "product 610" - AA-X-13 ARROW

K-37M / RVV-BD/ "product 610M"-AA-13 ARROW



Long-range air-to-air missile. In 1981, a technical proposal was submitted for a new MiG-31M interceptor with K-37 missiles. Development of a more advanced missile similar to the K-33 missile to arm the MiG-31M interceptor was started by the Vympel State Design Bureau in accordance with the Resolution of the USSR Council of Ministers dated April 8, 1983. The preliminary design of the K-37 missile was approved in 1983. The first flight of the MiG-31M prototype (serial No. 05-01-01) took place on December 21, 1985. Missile testing began in 1988 with autonomous ballistic missile launches without a guidance system (10 launches). In 1989, software missiles without a guidance system (4 launches) participated in the testing - flying under the control of an autopilot according to a program. In the same 1989, tests of missiles with a guidance system began (2 launches).

The first public appearance was the Minsk demonstration of new aviation equipment (Machulishchi, March 1992) - the missiles were shown on the underfuselage suspension of the MiG-31M (6 missiles on AKU-610 under the fuselage). The missile adopted many features of the prototype - the K-33 / AA-9 missile. In April 1994, Russian President B.N. Yeltsin congratulated the creators of the missile on the successful destruction of an air target at a record range of 304 km. Missile tests continued until 1997.

Probably, after 1997, due to the disruption of cooperation with Ukrainian enterprises that were involved in the creation of the missile guidance systems, a decision was made to develop a guidance system using only Russian components.

As of 2007, the Tactical Missiles Corporation (KTRV), represented by the Vympel State Design Bureau, was developing the RVV-BD missile, which is almost a complete analogue of the K-37 missile. It was planned to complete state tests of the missile by the end of 2011. It was decided to begin serial production as of August 2011. Preparations for serial production of the missile were underway throughout 2011. On 13 February 2012, Air Force Commander-in-Chief A. Zelin announced that a new long-range missile for MiG-31BM aircraft was in the final stage of testing. The missile will be accepted into service in the near future.

In 2014, the RVV-BD missile was accepted into service by the Russian Air Force, and its serial production was officially launched (KTRV Bulletin, No. 8 / 2015). As of autumn 2017, there is no information about the missile's receipt by the troops.

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Launch of the K-37/RVV-BD missile cruise engine - AA-13 ARROW (drawing by Alexander Yartsev, 2014, [source](#)).

Author: [DIMMI](#)

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Comments: [9](#)

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K-55 / R-55 - AA-1C ALKALI

DATA AS OF 2012 (standard replenishment)

Missile K-55 / R-55 / "product 67" - AA-1C ALKALI

Rocket K-55M / R-55M

★★★

A short-range air-to-air guided missile. Development of a variant of the K-51 missile with the thermal homing head of the K-13 missile was started in 1958 by the Design Bureau of Plant No. 455 (now GNPC Zvezda-Strela / JSC KTRV), Chief Designer - Nikolai Titovich Pikot. Project and prototype name - CM-6. Design documentation for the K-55 missile was released in 1960, bench testing of the control circuit and ground tests of the new warhead developed by GSKB-47 were carried out. During this period, the working name of the missile - "R-6" is mentioned - it is no longer encountered. Development of the K-55 missile was carried out in competition with the OKB-4 K-8M-8 project - the implementation of technical solutions of the K-8 missile in a missile of smaller dimensions. The K-55 missile was preferable from the point of view of organizing mass production.

The first prototypes were manufactured and tested in 1961, starting from February 4 and through March 25 - 6 launches of "program" TsM-6P missiles (missiles for autonomous testing without a seeker) and 1 launch of a telemetry missile with an IGS-59 seeker from altitudes of 10-15 km from a T-43-3 carrier were conducted. As of 1961, the K-55TG telemetry missiles (testing the IR seeker), K-55SV (testing the Lastochka fuse) and the K-55TS combat missile with an optical fuse were being produced. In 1962, 9 launches were conducted at luminous aerial bombs and targets descending on parachutes, as a result of which the seeker was refined. Routine maintenance was also carried out on the carriers used in missile testing - T-43-5 and T-43-12. In 1963, factory tests of missiles were continued on the T-43-12 and successfully completed in May 1964 - in the qualifying stage of tests, the T-43-12 shot down Il-28 and MiG-15 target aircraft.

Taking into account the results of the factory tests, the Military-Industrial Complex under the USSR Council of Ministers, by decision No. 228 of September 9, 1964, scheduled joint tests of the modernized weapons system of the Su-9 aircraft with K-51 / RS-2US and K-55 missiles for the 2nd quarter of 1965. The USSR Ministry of Defense was ordered to provide two Su-9 aircraft for the tests, and Plant No. 455 produced 35 K-55 missiles by the end of 1964. In 1965, during tests, 6 combat and 5 telemetry missiles were launched, four unmanned MiG-15s were shot down, and in 1966, 2 combat and 5 telemetry missiles were launched. As a result, it was possible to increase the sensitivity of the S-59 seeker.

Serial production of the missiles was launched by Plant No. 455 under the index "Product 67" in 1967, but due to shortages of the S-59 seeker in 1967, the plant fulfilled only half of the plan. In 1968, the plant reached the planned production targets for the modified missile (an impact fuse was introduced into the I-116 safety-actuating mechanism, the automation unit was improved, and the body of the second compartment was strengthened). The missile was also produced by the Moscow Kommunar Plant. The K-55 missile was officially accepted into service on the Su-9 aircraft under the designation R-55 on January 21, 1969. In terms of maneuverability, the R-55 missile was significantly superior to the K-13A missile, but was supposed to be inferior to the K-13M and K-60 missiles that were being developed.



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Combat missile R-55 (<http://www.airwar.ru> , processed).

Author: [DIMMI](#)

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K-5M / RS-2U / RS-2US - AA-1A/B ALKALI

DATA AS OF 2016 (standard replenishment)

Missile K-5M / RS-2U / "product I" / "product 1" - AA-1A / AA-1mod2 ALKALI

Missile K-5MS / K-51 / RS-2US / "product IS" / "product 4" - AA-1B / AA-1mod3 ALKALI

AA-1mod4-6 (?)

★★★★

A short-range air-to-air guided missile. Developed by OKB-2 (later MKB Fakel, general designer P.D. Grushin) based on the RS-1U missile ("product SHM"). During 1954, a search was underway for ways to modernize the RS-1U missile. The preliminary design of the K-5M / RS-2U missile, released in March 1955, implemented an increase in the wing area and engine fuel charge, and provided for the use of a more powerful warhead. The missile uses a new type of radio fuse.

Testing of the RS-2U missile began in the spring of 1956 in Vladimirovka. Autonomous missile launches (without a guidance system) were carried out from the MiG-19/SM-2M carrier aircraft (factory No. 59210108) with two APU-4 launchers and no radar. Later, two MiG-19PM/SM-7M aircraft equipped with RP-2U radars and four APU-4s joined the tests. The aircraft were converted into carriers at the Gorky Aircraft Plant No. 21. During test launches from altitudes of about 10 km, the phenomenon of MiG-19 engines stopping due to the exhaust gases of the launching missile was discovered.

In October 1957, tests of the future main carrier of the RS-2U missiles - the MiG-19PM/SM-7/2M - were conducted. In 1957, Aircraft Plant No. 21 in Gorky produced 7 SM-7/2M ("type 65") aircraft with RP-2U radars. Later, mass production of this modification of the MiG-19 began. Testing of the RS-2U missiles on the MiG-19PM / SM-7/2M began on October 14, 1957 and continued until October 24. As a result of the tests, a decision was made to adopt the system with K-5M / RS-2U missiles and begin their serial production. Also in July-August 1957, factory flight tests of the KS system, which regulates engine operation and prevents it from stopping when launching missiles, were conducted on MiG-19s with factory numbers 59210406 and 59210103.

By the Resolution of the Council of Ministers of the USSR No. 134-54 of November 28, 1957, the S-2U system with RS-2U missiles was accepted into service. Serial production of the MiG-19PM ("product 65") began at Aircraft Plant No. 21 in Gorky. A total of 369 aircraft were produced from 1956 to 1960.



K-5M/RS-2U missiles under the MiG-19PM fighter, side No. 18 red ([source](#)).

Author: [DIMMI](#)

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K-33 / R-33 - AA-9 AMOS

DATA FOR 2016 (standard update)

K-33 / R-33 / "product 410" missile - AA-9 AMOS

K-33S / R-33S missile

R-33E missile

★★★★

Long-range air-to-air missile. Preliminary studies of the interception system project with the Tu-148 interceptor with the Zaslon radar (target detection range - 110-115 km, missile launch range - 80-90 km) were conducted until the spring of 1968. After the death of the Air Defense Commander-in-Chief A. Kadomtsev in the spring of 1968, the Air Defense leadership opted for the interception system project with the E-155MP aircraft. The USSR Council of Ministers Resolution of May 24, 1968 provided for the development of a modernized [MiG-25](#) - the E-155MP interceptor. The interception system included the Zaslon radar and missiles with a launch range of 120 km.

The development of the K-33 missiles was entrusted to the Vypel State Design Bureau under the supervision of Deputy Chief Designer of the Design Bureau V.V. Zhuravlev and Lead Designer, and later Deputy Chief Designer of the Design Bureau and Head of Long-Range Missile Development in 1977-2007 Yu.K. Zakharov. The K-33's competing project was the [K-50](#) missile project of the M.R. Bisnovat Design Bureau. It was planned to develop five missile variants - with a radar homing head, with a thermal homing head, with a combined radar-thermal homing head, with an active radar homing head, and a missile variant with replaceable warheads. Sketch designs were prepared for each missile variant (*source* - Yu. Zakharov).

Models of the first two configurations of the K-33 missile were manufactured as early as 1968 - initially the missile had a "duck" aerodynamic configuration and was supposed to be suspended under the wing like the [R-40](#) missiles. Later, both the aerodynamic design and the suspension method were changed. The preliminary design of the K-33 missile in its current form was released in 1970. In 1972, the second edition of the preliminary design was released - with a multifunctional MFBU-410 seeker, a thickened body with large-chord, small-span wings, with the missiles placed in a semi-recessed position under the aircraft fuselage.

The Decree of the USSR Council of Ministers of May 12, 1974 tasked with developing an interception system with an E-155MP interceptor aircraft and a K-33 missile with a quasi-continuous semi-active radar seeker and a single high-explosive fragmentation warhead (*source* - Yu. Zakharov).

To test the components of the interceptor system, aircraft laboratories were created - for testing the K-33 missile homing head - LL-21 based on the MiG-21 (plant No. 76211524), for testing the Zaslon radar and missiles - the LL-2 / LL-104-518 aircraft laboratory based on the Tu-104 (plant No. 42324). The conversion of the Tu-104 was carried out by the Vzlet Scientific and Technical Complex starting in 1970. Starting in 1972, the Tu-104 was used to test the Zaslon radar and the MFBU-410 homing head, installed in full-size mock-ups of the GVM-410 missiles. For testing during 1972, 8 launch prototypes of missiles (for unguided launches), 1 throwing missile and 5 program missiles (without a homing head, but with autopilot).



Алексей Резниченко © felik1970.livejournal.com

R-33 missile of the MiG-31DZ aircraft. Photo taken during a surprise inspection of the Air Force's combat readiness at the Pemboy training ground near Vorkuta, May 2013 (photo - Alexey Reznichenko, <http://felik1970.livejournal.com/>).

Author: [DIMMI](#)

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R-60 / R-60M - AA-8 APHID

DATA FOR 2014 (standard update)

Rocket K-60 / R-60 / product 62 - AA-8A APHID-A

R-60K missile - export version

K-60M / R-60M / product 62M - AA-8B APHID-B R-60MK

missile - export version - AA-8C APHID -C

★★★★

A short-range missile. Developed by OKB-4 of M.R. Bisnovat (now NPO Molniya). The study of the concept of a close-range missile was started in the late 1960s by the Research Institute-2 of the USSR Ministry of Aviation Industry (GosNIIAS) under the supervision of R.D. Kuzminsky and V.F. Levitin. It was proposed to create the K-60 missile based on the 9M31 SAM of the [Strela-1](#) air defense system developed by KBTM of Chief Designer A.E. Nudelman - in the same dimensions, with the same, relatively light, warhead. The development of the new missile was started by OKB-4 in 1968, under the supervision of Chief Designer M.R. Bisnovat and his First Deputy V.I. Elagin, and the leading designers were A.L. Kegeles, G.N. Smolsky and I.N. Karabanov. Officially, the

development of the missile was assigned to OKB-4 by the Resolution of the Council of Ministers of the USSR dated January 21, 1970.

In 1969, technical documentation for the K-60 missile was prepared and the production of the first experimental batch of missile sections (28 units) began. In 1971, the development of the seeker head on a flying laboratory aircraft began. In the same 1971, missile launches began - at the first stage, launches were carried out from a ground launcher using tracers on a test site tower (range from 500 to 1500 m, 6 launches), then tests were conducted from the MiG-21SMT flying laboratory aircraft, board No. 117 (4 autonomous launches and two launches of telemetric missiles at parachute targets). Also in 1971, two MiG-23M (aircraft numbers 602 and 605) were connected to the tests, and since 1972, two more MiG-23M (aircraft numbers 1701 and 1801) were added. The chief designer's testing stage was completed in August 1972. In total, during 17 launches performed in 1971 and 43 launches in 1972, 7 MiG-17 and La-17 targets were shot down. In 1973, more than 50 missile launches were performed during the State Tests. The launches were carried out from MiG-21SMT and MiG-23 (aircraft numbers 2503, 1201, 1901, 1231).

On December 18, 1973, the missile under the designation R-60 was accepted into service. Serial production of the missile was carried out from 1974 to 1991 at the Tbilisi Aviation Plant. In total, the plant produced more than 30,000 missiles, in some years the production rate reached 6,000 units per year. Also, until 1991, the missile was produced by the Izhevsk Mechanical Plant (Izhevsk) and the Moscow Kommunar Plant (now Duks).

The first mention in the Western specialized press - 1976 - Western observers first noticed the missile on the suspension of the MiG-23. By default, the data of the R-60 missile.



R-60M missile on the PU-62-1 suspension unit, MAKS-2007 air show (photo - VovanJorf, <http://fotki.yandex.ru>).

Author: [DIMMI](#)

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Comments: [16](#)

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R-73 / RVV-MD - AA-11 ARCHER

DATA AS OF 2014 (standard replenishment)

Missile K-73 / R-73 / "article 72" / "R-72" - AA-11 ARCHER

Missile R-73 / R-73RMD1 - AA-11 ARCHER

Missile R-73M / R-73RMD-2 / RVV-MD - AA-11 ARCHER-M

Missile K-73E / R-73E (export)

Missile K-74ME (export model based on R-73M)

Missile K-74M2 / RVV-MD - AA-11 ARCHER-M

★★★★

Short-range air-to-air missile. Development of the highly maneuverable K-73 close-range air combat missile, as a development of the K-60 missile, was started by the Molniya Design Bureau (OKB-4 M.R.Bisnovata) in accordance with the Decree of the USSR Council of Ministers dated July 26, 1974. Chief Designer - M.R.Bisnovata. According to the initial design, the missile was created without taking into account the all-aspect homing head and only with gas-dynamic control. It was probably planned to use a modified homing head of the K-60 missile. After choosing the all-aspect homing head "Mayak" developed by PO "Arsenal", a modern aerodynamic configuration with a change in the dimensions of the missile was adopted at a meeting led by the deputy chief designer of the missile G.P.Dementyev. Probably, this adjustment of the project took place in 1976. In 1977, after the death of M.R. Bisnovat, G.I. Khokhlov became the chief designer of the missile.

Since October 1978, the development of the seeker head was carried out on the LL-124 flying laboratory aircraft based on the Tu-124. Testing of simplified prototypes of K-73 missiles from ground launchers began in 1979. The operation of gas-dynamic control surfaces was developed. In the same 1979, 8 flights of the MiG-23ML (side No. 123) and three launches of K-73 missiles were performed as part of factory tests. In 1980, a MiG-17 flying target was shot down for the first time from this MiG-23ML. In 1981, the third serial MiG-29 (No. 9-19) joined the tests; it shot down a MiG-21M target.



A training and operational model of the R-73L missile with an optical fuse. Equipment exhibition in Ramenskoye, 100th anniversary of the Russian Air Force, 12.08.2012 (photo - pfc-joker, <http://pfc-joker.livejournal.com>).

Author: [DIMMI](#)

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K-27 / R-27 - AA-10 ALAMO

DATA for 2013 (standard replenishment)

K-27 / R-27 / product 470 / 9-A-1101 - AA-10 ALAMO

K-27R / R-27R / product 470-1 / 9-A-1101K - AA-10 ALAMO-A

K-27T / R-27T / product 470-3 / 9-A-1023 - AA-10 ALAMO-B

K-27ER / R-27ER / product 470-1E - AA-10 ALAMO-C

K-27ET / R-27ET / product 470-3E - AA-10 ALAMO-D

R-27P / 9-A-1032 - AA-10 ALAMO-E

R-27EP - AA-10 ALAMO-F

R-27A / 9-A-1103

R-27AE

R-27EM / R-29ME - AA-10 ALAMO-M

★★★★

A family of modular medium- and extended-range air-to-air guided missiles. Development of the K-27 missile was started by the Vypel State Design Bureau (Moscow) in 1972. The missile was developed as a single medium-range missile to arm the prospective MiG-29 and Su-27 fighters. The Sukhoi Design Bureau and the GosNIIAS proposed developing two versions of the missile - a basic version identical in characteristics to the AIM-7R Sparrow missile and intended for the MiG-29, and an "energy" version with an increased range intended for the Su-27. A modular missile design was proposed for the purpose of unification. In late 1973, the medium-range missile concept was discussed at a meeting at the Ministry of Aviation Industry and Trade with the participation of the GosNIIAS, the Sukhoi Design Bureau, the Mikoyan Design Bureau, the Vypel Machine Building Plant, and the Molniya PKPK. Proposals for the concept of creating a modular medium-range missile were officially formalized in the Decision of the MAP, MOP, MRP, MM and the Air Force approved in February 1974. The preliminary design of the missile was conducted on a competitive basis by the Vypel Design Bureau and the Molniya Design Bureau. Preliminary results were summed up at the end of May 1975 - the Vypel Design Bureau won the competition - K-27 / product 470 (*history - Su-27 fighter ...*).

The development of the K-27 missile was supervised by the deputy chief designer of the Vypel Design Bureau P.P. Dementyev, the leading designers at different times were V.T. Korsakov, A.V. Kharlamov and I.V. Balovnev. At the stage of the preliminary design, two options for the missile layout were considered - a normal aerodynamic configuration and a "duck" configuration or a missile configuration with a rotating wing of an original shape. GosNIIAS supported the traditional aerodynamic scheme, and TsAGI recommended a scheme with an original rotary wing. It was chosen for design (*source - Su-27 fighter...*).



R-27R missile launched from a Bulgarian MiG-29 moments before the UAV was destroyed. The frame was taken by the UAV's video system. Published on 09.12.2013 ([source](#)).



R-27R missile on the APU-470 launcher under an Iranian Air Force F-14, published on 07.07.2012 (<http://www.militaryphotos.net>).



R-27ER missile or its training modification under the Su-30MKK, side No. 502, white, owned by JSC Sukhoi, Ramenskoye, February 2013 (photo by Anatoly Burtsev, <http://russianplanes.net/id118223>).



A German Air Force MiG-29 launched an R-27R - AA-10 ALAMO-A missile. 73rd Wing, Laage AB, 10 June 2003 (photo by Michael Ammons, USAF, <http://commons.wikimedia.org>). R-27R and [R-60M](#)



missiles under the wing of a MiG-29 of the DPRK Air Force, photo no later than 2009 (KCNA, <http://www.afp.com>).

Author: [DIMMI](#)

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K-77 / R-77 - AA-12 ADDER

DATA FOR 2012 (standard update)

Rocket K-77 / R-77 / RVV-AE / AAM-AE - AA-12 ADDER / AMRAAMski

Rocket K-77M / R-77M

Rocket K-77-1 / RVV-SD RVV-AE-PD

rocket (version with ramjet)

★★★

Medium-range air-to-air missile. Development of a medium-range missile with an active radar homing head and a mass of up to 160-165 kg, similar to the American AIM-120 AMRAAM missile, was started by the decision of the Military-Industrial Complex under the Council of Ministers of the USSR on March 19, 1980. R&D work on the missile was carried out by GosMKB Vypel together with NPO Molniya, GosNIIAS and TsAGI. The development managers were G.A. Sokolovsky and V.A. Pustovoirov. By 2005, the chief designer of the missile was V.G. Bogatsky (GosMKB Vypel). In 1981, a technical proposal for the missile and an addendum to it were prepared. The decree of the Council of Ministers of the USSR which set the R&D work on the creation of the K-77 missile was issued on July 31, 1982. The missile is intended for use against highly maneuverable targets, including air-to-air missiles AIM-120 AMRAAM and AIM-54 "Phoenix" (USA), as well as anti-aircraft missiles of the MIM-104 "Patriot" type (USA).

The creation of the missile control system was started in the mid-1980s by NPO Istok (Fryazino) as part of the work on the Soyuz research and development project to create a new generation radar for fighters. The work was headed by S.I. Rebrov. Together with GosNIIAS, the missile's homing head was integrated into the missile control system, built on a strapdown gyroinertial system with an on-board digital computer. The integration of the onboard digital computer and the autopilot was carried out by the Research Institute of Instrument Engineering under the direction of B.N. Gavrilin.

The first eight ballistic launches of the K-77 missiles were conducted in 1983. Beginning in May 1984, the K-77 missile underwent flight tests from the MiG-

29 carrier (serial No. 09-21 - 09-19 according to other data) - by the end of 1984, 18 missile launches were performed without a guidance system. In December 1984, MiG-29 serial Nos. 09-23 and 09-70 joined the test program, and in June and August 1985, respectively, MiG-29 serial Nos. 09-25 and 09-71. In 1984, serial production of the K-77 missile began at the Kiev Artem Plant (Ukraine, production continued until the collapse of the USSR). State tests with launches at La-17 targets and Tu-16 and MiG-21 unmanned target aircraft were conducted with MiG-29 aircraft (No. 09-21, 09-70 and 09-71) from 1988 to 1991. In 1992-1993, the missile underwent military trials. The K-77 missile was officially accepted into service on February 23, 1994. Serial production of K-77 missiles for the needs of the Air Force in Russia was not carried out, and serial production of K-77 missiles for export was carried out by the pilot production of the GosMKB Vypel.

As of 1996, GosMKB Vypel is working on creating modifications with an IR homing head (with trajectory capture), with a combined rocket-ramjet engine (RVV-AE-PD), a version of the missile for use in an SAM (RVV-ZRK). The first mention and projections of the R-77M missile in the press - 1998. The K-77-1 / RVV-SD missile is a version of the K-77 missile using only Russian-made components. Probably, as of 2011, the K-77-1 missile has been accepted into service or is completing the state testing program.



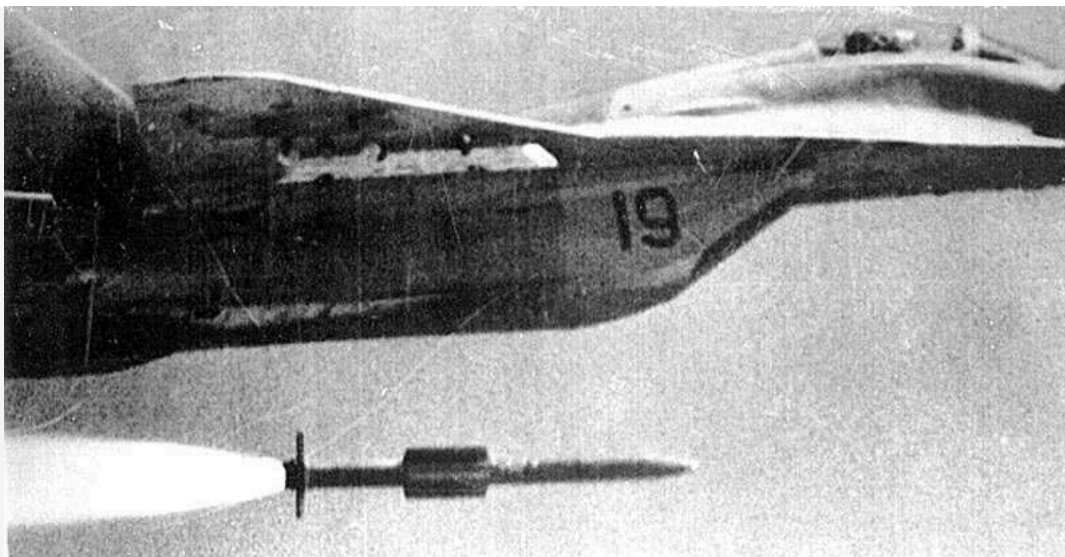
K-77-1/RVV-SD missile at MAKS-2011 (photo by Said Aminov, <http://saidpvo.livejournal.com>).



K-77 missile mockup suspended under Su-30MKI fighter, India, 2011 (<http://forums.eagle.ru>).



R-77 missiles under the wing of MiG-31M, aircraft no. 057 (<http://militaryphotos.net>).



One of the K-77 test launches from MiG-29, aircraft no. 19 (<http://militaryphotos.net>).

Author: [DIMMI](#)

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K-9 / K-9-155 - AA-4 AWL

DATA AS OF 2012 (standard replenishment)

K-9 missile

K-9-155 missile - AA-4 AWL

K-9M missile

★★★

Experimental air-to-air missile . The creation of a missile with a radar homing head was assigned by the Resolution of the Council of Ministers of the USSR No. 419-198ss of 16.04.1958 and the Order of the State Committee on Aviation Technology No. 211ss/ov of 17.06.1958. Design Bureau of Plant No. 134 of the State Committee on Aviation Technology, Chief Designer - I.I. Toropov. The creation of the missile guidance system was assigned to KB-1 of the State Committee on Aviation Research. It was planned to submit prototypes of the missiles for joint flight tests in the 2nd quarter of 1960. But in 1959, a decision was made to transfer the development of the K-9 missile to the creators of the carrier aircraft for it - to OKB-155 of Mikoyan and Gurevich (the K-9-155 missile, the E-152 aircraft) and to OKB-51 of P.O. Sukhoi (the K-9-51 missile , the T-37 aircraft). The K-9-155 missile was developed by a design team led by V.G. Korenkov for arming the interception complex with the E-152 carrier.

The missile was intended for all-aspect engagement of air targets. It was assumed that the missile would be part of the automated air target interception complex with the Uragan-5 automated control system. But by the time the missiles were put to the test, the Uragan-5 project had already been closed, and the missiles were finalized and tested as part of the work on the E-152-9 interception system in 1961 with the E-152 aircraft and the Uragan-5B control system.

According to the USSR Council of Ministers Resolution No. 608-293ss of 04.06.1959 and the State Committee on Aviation Industry Order No. 345ss of 26.08.1959, it was planned to produce 20 missiles in four versions for testing - ballistic, software, telemetry, and combat (products 91, 92, 93, and 90, respectively). It was planned to produce 20 "products 91", 5 "products 92", 5 "products 93", and 2 "products 90". Drawings for "products 91" and "92" were submitted for production in mid-1959. By the end of 1959, work on the drawings of the remaining products was completed and the first 6 units of "product 91" were released, and production of "product 92" began. By the end of 1960, 21 units of "product 91", 7 units of "product 92", and 4 units of "product 93" had actually been assembled. The release of the combat version of the missiles was postponed due to the incompleteness and non-delivery of components through KB-1 (autopilots, power supplies, and seeker heads) and Plant No. 567 (BR-6A telemetry stations). Also, as of 1960, four carrier aircraft were being prepared for testing the complex - E-150, two E-152s, and an E-152A. Only the E-152-2, E-152A and, later, E-152M (with K-9 or K-80R missiles) were intended for flight testing of the K-9 missile.



AA-4 missiles under E-152A (Eyer mann K.-H. MiGs. Berlin, 1985, GDR).



E-152-1 fighter with K-9 missiles (from the Cabal archive, <http://militaryphotos.net>).



E-152A fighter with K-9 missiles (<http://militaryphotos.net>).

Author: [DIMMI](#)

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SNARS-250 / I-64

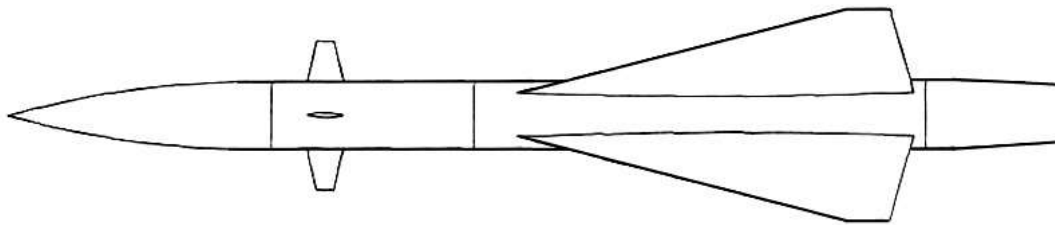
DATA AS OF 2013 (standard replenishment)

SNARS-250 / R&D I-64

★★★

Self-guided air-launched missile / air-to-air missile. Preliminary studies on the subject of creating air-to-air missiles were carried out by a group of engineers from NII-1 MAP in the branch of NII #1 - former Plant #293 in Khimki. In June 1946, the branch was transformed into an independent plant. M.R. Bisnovat was appointed director of the plant and chief designer of the OKB at the plant, V.N. Elagin was appointed deputy.

The development of the air-to-air missile was assigned by Resolution of the Council of Ministers of the USSR #1175-440ss of April 14, 1948 and by order of the MAP of May 11, 1948 and assigned to the design bureau of Plant #293 under the leadership of M.R. Bisnovat (later - OKB-4, now - MKB "Molniya"). The tactical and technical requirements for the missile were issued by the 4th Directorate of the State Research Institute of the Air Force on June 9, 1948. Initially, the development was carried out as a research project. It was assumed that a guidance method would be used, which was the prototype of the proportional approach method that was later widespread. According to the assignment, the projectile was intended to destroy bombers from the rear hemisphere (ZPS) in pursuit, flying at speeds of up to 150-300 m/s and ranges of up to 5000 m. The approach speed in this case had to be at least 100 m/s. The decree set the deadline for the completion of the draft design - September 1948 - due to the complexity of the project, the deadline was not met. By the end of 1948, the design materials of related companies - Plant No. 40 and Research Institute-885 - were not ready. In the first quarter of 1949, the Design Bureau of Plant No. 293 (the prime contractor) presented a comprehensive technical project to the customer. Also in 1948, tests of rocket models in various configurations began in the T-106M and T-112 TsAGI wind tunnels. In 1948, Plant No. 293 developed and built prototypes of "product 9" for research in the TsAGI wind tunnels. In 1949, flight tests of "product 9" were conducted - a flying model with a liquid-propellant rocket engine for testing aerodynamics at high flight speeds. In addition to "product 9", the plant produced flight models (factory code "14/12" or "12", LM-12) for further research with various wing and tail profiles. In 1948, 6 copies of the LM-12 were built and one model was tested at TsAGI. In the summer of 1949, several LM-12 launches were performed at the Flight Research Institute of the Ministry of Aviation Industry. In 1948, a preliminary design for "product 14" was also released - the actual projectile for the I-64 research project. In 1949, the on-board equipment of the rocket began to be linked on a special model, and in the same year, assembly of aerodynamically similar rockets with autonomous control ("object 20") began. Control, recording and measuring equipment for recording flight parameters was placed on board the "object 20" rockets. In the same 1949, on the first series of "object 20", tests of the objects began on a Tu-2 aircraft specially equipped with suspensions and a launch system. In 1950 ballistic launches of "Object 20" missiles without a guidance system were carried out.

Projections of the SNARS-250 missile (<http://www.airwar.ru>).Author: [DIMMI](#)

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K-8 / K-8M - AA-3 ANAB

DATA AS OF 2013 (in progress)**Rocket K-8 / K-8R / K-8T / product 24 - AA-3 ANAB****Missile K-8-2 / K-8M / R-8M / product 24M - AA-3 ANAB****Missile K-8M1 / R-30R / R-30T - AA-3 ANAB**

★★★

Medium-range air-to-air missile. The development of the missile was assigned by the Resolution of the USSR Council of Ministers No. 2543-1224 of December 30, 1954 on the creation of homing missiles K-6, K-7 and K-8. The design was carried out by OKB-4 (later renamed NPO Molniya) under the leadership of M.R. Bisnovat and his deputy V.N. Elazhka starting in 1955. Several homing head variants were developed for the K-8 missile on a competitive basis. Factory testing of the K-8 missile began in 1957. Two Yak-25K-8 and two Yak-27K aircraft were involved in the testing. During the tests, 74 flights of carrier aircraft were performed, as a result of 7 launches, 4 parachute targets and three Il-28 target aircraft were shot down at altitudes of 9-10 km and ranges of 5-6 km. The development of missiles with radar homing heads was delayed - in August 1959, tests of the K-82 / product 24V missile with the PARG-1 semi-active radar homing head were completed, and tests of the K-83 / product 24D missile with the RGS-1 radar homing head were completed on November 2, 1959. The missile was not accepted into service.

In 1958, the creation of the modernized K-8-2 (K-8M) missile began. Testing of the K-8-2 missiles on the T-47 aircraft began in the first half of 1959. The interception complex with K-8M missiles and the T-47 carrier was presented for State tests on September 17, 1959. State tests lasted from November 1959 to May 1960. Due to the incompleteness of the RP-11 "Orel" radar of the T-47 / Su-11 interceptor, at the first stage a missile with an IR homing head was tested, and later - with a radar homing head. On February 5, 1962, by Resolution of the Council of Ministers of the USSR No. 139-67, the Su-11-8M interception complex with a missile named R-8M was accepted into service. The interception complex included four components: the carrier aircraft, missiles, the interceptor radar and ground support facilities. Serial production of R-8M missiles was carried out at the Izhevsk Mechanical Plant. A total of about 100 Su-11 interceptors were produced.

Yak-27K fighter, board No. 58, with K-8 missiles during testing (<http://www.arms-expo.ru>). Su-11, board No. 10, with K-8M missiles (<http://militaryphotos.net>).



K-8M1/R-30 missiles with radar seeker (left) and IR seeker (right) under Yak-28P, aircraft no. 15
(E. Gordon, From the jet family. // Wings of the Motherland. No. 9 / 1991)

Author: [DIMMI](#)

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K-98 - AA-3-2 ADVANCED ANAB

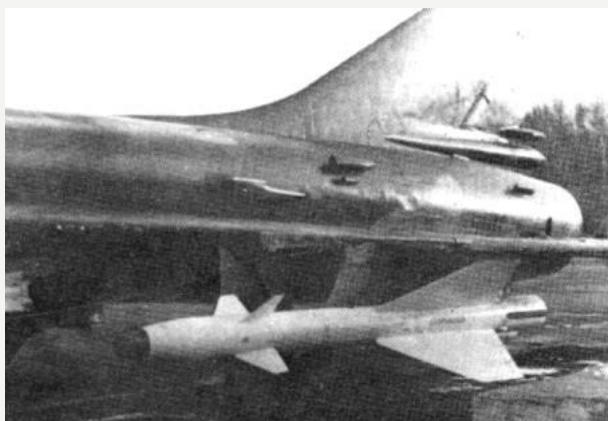
DATA FOR 2013 (in progress)

Missile K-8M2 / K-98 / R-98 (R-98R / R-98T) / product 56 - AA-3-2 ADVANCED ANAB

Missile K-98M / R-98M (R-98RM / R-98TM) - AA-3-2 ADVANCED ANAB

★★★

It was created on the basis of the K-8M2 missile in OKB-4 (now NPO Molniya) under the leadership of Bisnovat. It was accepted into service in 1969. It is used from the PU-1-8 launcher (on the Su-15).



R-98T missile under Su-15TM (Malakhov S., Su-15: from flight practice. // "Aeroplan" No. 4/1994).

Author: [DIMMI](#)

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KS-172 / RVV-L / AAM-L

DATA AS OF 2012 (standard replenishment)

KS-172 / "product 172" / RRV-L / AAM-L

KS-172S-1 / AAM-L

★★★★

An ultra-long-range air-to-air missile. The development of the missile using the developments of the 3M83 missile of the S-300V air defense system was started by the Novator Design Bureau (Sverdlovsk, now Yekaterinburg) in 1991 (in 1984, *according to Karpenko*). A model of the missile called AAM-L (Air-Air-Missile - Long range) was first demonstrated in 1993 at the arms and military equipment exhibition in Abu Dhabi and at the MAKS-1993 air show. According to available information, ground tests of the missile were conducted in 1993 - probably throw launches. According to data from 2001, the KS-172 development program is not a priority for the Russian Air Force, and in December 2003, an export modification of the missile - KS-172S-1 - with a modified design was first presented at an air show in Dubai.

In the second half of the 2000s, the Russian Ministry of Defense held a competition for a long-range air-to-air missile. The competition was attended by OKB Novator with the KS-172S-1 missile and GosMKB Vypel with the K-37 missile. The competition committee of the Russian Ministry of Defense denied OKB Novator permission to participate in the closed competition "Creation of a long-range air-to-air guided missile (OKB Grafoman - *source* - *Annual report*)" for formal reasons (*source* - *Karpenko*).



A model of the KS-172 missile at an exhibition in Zhukovsky, 1993 (photo - Piotr Bu tovski, Nowa Technika Wojskowa №1 / 1994).



A model of the KS-172S-1 missile at the MAKS-2005 air show (photo from the Rambo54 archive, <http://militaryrussia.ru/forum/>).



A model of the KS-172S-1 missile under the wing of the Su-35BM, board №901, probably at the MAKS-2005 air show or later (photo - Miroslav Gyurosi, <http://www.ausairpower.net>).

Author: [DIMMI](#)

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K-80 / R-4R / R-4T / K-80M - AA-5 ASH

DATA FOR 2012 (in progress)

Missile K-80 / R-4T / R-4R (article 36, IR and radar mod.) - AA-5 ASH

Missile K-80M / R-4TM / R-4RM (article 36M, IR and radar mod.) - AA-5 ASH

★★★

Long-range air-to-air missile of the Tu-28-80 interception complex. Developed in OKB-4 under the supervision of M.R. Bisnovat. The development of the long-range interception complex was specified by the Resolution of the USSR Council of Ministers No. 608-293 of June 6, 1958. The complex was created with the main task of long-range interception of bombers of the alleged enemy in the polar regions over the Arctic Ocean. The range of the missile with a heavy warhead (to ensure guaranteed destruction of targets) was to be 2 times greater than the ranges of the K-7, K-8M and K-9 missiles being developed at that time. The submission of the complex for factory testing was prescribed to be carried out in the first quarter of 1961, and for state testing - by the end of 1961. The requirements for the complex were tightened by the Resolution of the USSR Council of Ministers of July 4, 1959.

The design documentation for the missile was released in 1959. In 1960, the design documentation was revised due to the use of a new power source and a new autopilot, as well as clarification of the requirements for tying the missile to the carrier. To eliminate flutter, the shape of the aerodynamic rudder was changed, the tip of which was beveled with a decrease in the span along the trailing edge. This shape allowed for an almost optimal set of profiles without switching to undesirable small thicknesses on the periphery of the trailing edge.



Tu-28 with R-4TM/R-4RM - AA-5 ASH missiles (<http://vnfawing.com>).



R-4R - AA-5 ASH missile in the Air Force Museum in Monino (<http://en.valka.cz>).



R-4T - AA-5 ASH missile in the Air Force Museum in Monino (<http://en.valka.cz>).

Author: [DIMMI](#)

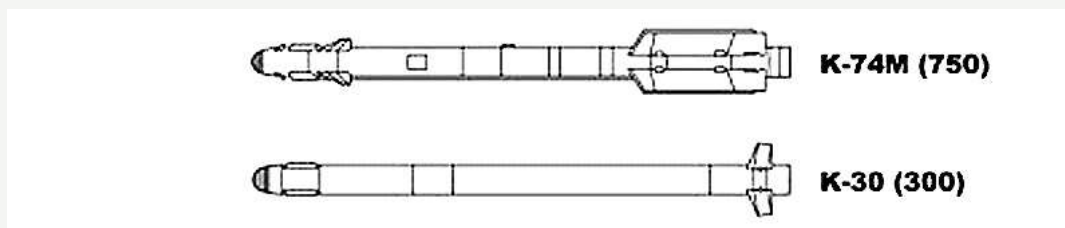
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K-30 / K-MD / product 300

DATA AS OF 2012 (in progress)**K-30 / K-MD / "product 300"**

Short-range air-to-air missile. Development of the missile was started by the Vypel State Design Bureau in 1986 with the aim of creating the next modification of the [R-73](#) close-range missile (*source - Jane's, Tactical*). As of 2008, work on the missile project was still underway, and perhaps even prototypes were being tested. Completion of the missile's creation was expected in those years by 2013 (*source - Based on materials*). The purpose is close, highly maneuverable air combat and the destruction of attacking air-to-air missiles (*source - Based on materials*). It is planned to place the missile in the internal compartments of the carrier aircraft. In 2002, Ukraine announced plans to create its own missile "611" based on the developments of the Soviet era on the K-30 missile (*source - Jane's*).



Alleged projections of the K-30/K-MD missile next to projections of the K-74M missile (drawing - Petr Butovsky, 2009, [source](#) , processed).



Model of the Ukrainian missile "611", which may have some common features with the K-30 missile (photo - Andrey Fomin, <http://forum.keypublishing.com>).

Author: [DIMMI](#)

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K-77PD / RVV-AE-PD

DATA FOR 2012 (in progress)**K-77PD / RVV-AE-PD missile**

Extended-range air-to-air missile. The development of a ramjet-powered missile based on the [K-77/RVV-AE](#) missile has been underway at GosMKB Vypel since at least the early 1990s. Some sources indicate that the development of an air-to-air missile with a ramjet was started in response to similar work in the West. A model of the missile was first shown at the Farnborough Air Show in 1993. The design of the missile was completed in 1999. A model of the missile was demonstrated at the MAKS-1999 air show. In fact, we do not yet know whether the missile has been tested or not. There is no other information.



Model of the RVV-AE-PD missile at the MAKS-2001 exhibition (photo - A.V. Karpenko, <http://bastion-karpenko.narod.ru/>).

Author: [DIMMI](#)

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K-5 / RS-1U - AA-1 ALKALI

DATA AS OF 2012 (in progress)

S-1U system, K-5 / RS-1U missile / "article SHM" / "article M" - AA-1 ALKALI / AA-1mod1 The first Soviet air-to-air guided missile adopted for service / "first guided rocket". Development of the air-to-air missile weapon system was started by KB-1 of the Third Main Directorate under the USSR Council of Ministers in 1951. The development was officially assigned by Resolution of the USSR Council of Ministers No. 1587-590 dated April 1, 1952. The weapon system was immediately designed for installation on a MiG-15 / MiG-17 class fighter with 4 launchers, which was supposed to ensure an acceptable probability of hitting an air target. The development of the missile was carried out in Department No. 32 of KB-1 under the supervision of [D. L. Tomashevich](#). The missile was assigned the index "product SHM" (according to the legend - "SH-Small" in contrast to the anti-aircraft "SH-Big"). On July 18, 1952, by order of the USSR Ministry of Aviation Industry, the Gorky branch of OKB-155 (MiG) was tasked with the conversion of three MiG-17P fighters into SP-6 missile carriers by the end of the summer of 1952. In addition to the three Gorky SP-6, two more aircraft were produced on time by Plant No. 153 in Novosibirsk. But missile testing did not begin until 1953. In early summer 1953, ground-based drop tests of the "product SHM" missile prototypes - B-89 - began. At the same time, static tests of "product SHM" were completed. By the end of the summer of 1953, the production of prototypes of the "Product SHM" missiles for autonomous flight tests (without a guidance system) - B-140 - began. A group of Il-28 photo aircraft was prepared to conduct flight tests. On October 8, 1953, the first autonomous launch of the "Product SHM" was performed from a MiG-17P / SP-6 carrier. The test was conducted in the area of the Vladimirovka proving ground (Astrakhan Region). The missile made a relatively straight flight. The first series of tests included a series of launches - with intervals of three to four days, four more were carried out (five in total). The launches were carried out from a MiG-17P / SP-6 by test pilots Konstantin Kokkinaki and Viktor Zavadskiy.

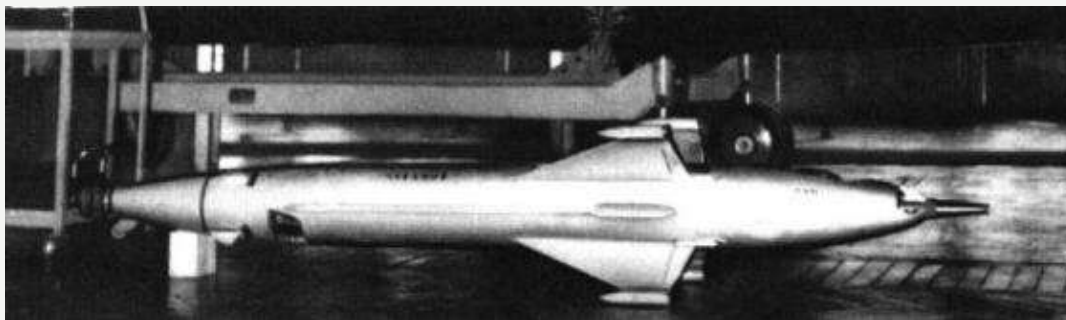
★★★★



RS-1U missile in flight. Drawing from the technical description of the missile, 1955 (Korovin V., Fakel Missiles. Moscow, MKB Fakel, 2003).



MiG-17PFU with RS-1U missiles (Korovin V., Fakel Missiles. Moscow, MKB Fakel, 2003).



The RS-1U/K-5 missile at the USSR Air Force Museum in Monino (Flieger Jahrbuch 1979, Berlin, 1978, GDR).

Author: [DIMMI](#)

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K-25 / R-25

DATA AS OF 2012 (standard replenishment)

K-25 / R-25 / "article 370" missile

★★★★

Long-range air-to-air missile. The missile was developed based on the captured AIM-7E Sparrow missile by the Design Bureau of Plant No. 134 (OKB-134, now MKB Vympel), chief designer - V. T. Korsakov. The trophy was delivered to the USSR in good condition from Vietnam, where it was removed from an F-4 Phantom aircraft that sank at a shallow depth near Haiphong. Missiles from other downed American aircraft were also delivered to the USSR. In the second half of 1966, work began on reproducing a sample of the American missile. The official start of the work on copying the medium-range missile for the MiG-23 fighter's weapons system was given by the Resolution of the USSR Council of Ministers dated November 13, 1967. At the first stage of development, domestic analogues were used instead of some of the original materials, which did not ensure the operability of some of the systems and units.

In 1970, after the completion of the autonomous development of the K-23, the MiG-21PF experimental aircraft (serial No. 12-03) was re-equipped for the K-25 missile (E-7 with K-25). The APU-25-11 launcher was installed on the aircraft, but in 1970, due to the unavailability of the engine and steering gear, the tests of the K-25 missile never began. In 1971, the MiG-21PF was again prepared for autonomous testing of the K-25, and the re-equipment of two MiG-23M aircraft (serial numbers 06-06 and 06-07) with the installation of the APU-25-23M began.



The K-25 missile in the center in the background in the GosNIAS museum, 2007 (photo - Evgeny Erokhin, <http://www.missiles.ru>).



Model of the MiG-29 preliminary design from 1972 with K-25 missiles (Yakubovich N.V. MiG-29. The "invisible" fighter. Moscow, Yauza, EKSMO, 2010).

Author: [DIMMI](#)

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K-7 / K-75

DATA AS OF 2012 (standard replenishment)

K-7 Rocket

K-75 Rocket

★★★

An experimental air-to-air missile. The development of the missile was assigned by the Resolution of the Council of Ministers of the USSR dated December 30, 1954 and was carried out by the Design Bureau of Plant No. 134 (OKB-134, now the Vypel Design Bureau), chief designer I. I. Toropov. Initially, the missile was designed to arm the T-3 interceptor of the P. O. Sukhoi Design Bureau. The first missile developed according to the project was the K-7L with radar beam guidance and a more powerful warhead than the K-5, to minimize the shortcomings in guidance accuracy. Due to the choice of the already widespread radar beam guidance system, the development of the K-7L progressed significantly faster than other missile variants.

In 1956, the Yak-25 carrier aircraft (serial No. 01-09) was re-equipped and underwent factory tests. The aircraft was equipped with a mock-up of the Almaz radar. In 1956, the aircraft launched beam-guided K-7L missiles, and in 1957, tests were continued. In total, 99 flights were performed in two years, and 38 K-7L missiles were launched.

A smaller version of the K-7L missile for testing the guidance system and equipment, the K-75, entered testing before its full-size counterpart. The missile was guided to the target by the Izumrud-2 radar, similar to the K-5 missile. Launches of K-75 missiles began in 1956 from converted Yak-25K carrier aircraft (serial numbers 16-08 and 18-08). From March 5 to June 10, the Yak-25K (serial number 16-08) with the upgraded Izumrud radar performed 23 flights and conducted three missile launches at altitudes of 5 and 12 km. The K-75 missile did not have a noticeable advantage over the technologically more preferable K-5M - a modernized K-5. In November 1957, the Yak-25K (serial number 16-08) was returned to the Air Force Flight Research Institute and re-equipped for testing TRS-85 unguided aircraft missiles.

By the end of September 1958, 25 K-7 missile launches were conducted from MiG-19 / SM-6 aircraft (plant numbers 2100101 and 2100102 - the same ones used in testing the K-5 missile). The correctness of the main technical solutions incorporated into the missile was confirmed. The test results also confirmed the possibility of using missiles from T-3 and Yak-25 carriers. The unavailability of the main carrier, the T-3, did not allow joint tests to begin, and already in 1957 the T-3 developers began to lean toward switching to the more promising homing missile K-8, which was being developed in OKB-4 M.R. Bisnovata.

In addition to missiles with radar beam guidance, work was also carried out on K-7 variants with K-7S-3 semi-active radar guidance and K-7ST with IR homing head. The preliminary design and working design documentation for the K-7S-3 missile were released in 1957, and its testing began in 1958. In addition to the T-3 prototype, the Yak-25 carrier (serial No. 02-21) was used in the testing. As a result, out of 38 planned launches from the T-3 and Yak-25, only 1 launch from the Yak-25 was carried out. Also in 1958, 3 test launches of K-7ST missiles with thermal homing heads developed by OKB-393 and NII-10 were carried out. Also, according to the Decree of the Council of Ministers of the USSR of March 7, 1957, for arming the E-150 interceptor (2 missiles) with the Uragan-56 radar, the development of another version of the K-7 missile began - the K-70 missile with a homing head developed by OKB-287.

In 1958, in connection with the successful testing of the more universal homing missile K-8, as well as in connection with the task of OKB-134 to copy the Sidewinder missile (K-13), the development of the K-7 family of missiles was terminated.



Experimental interceptor T-3 with missiles K-7L (Pavlov V. Supersonic trumpets of the "all-Union orchestra" of air defense. // Aviation and Time. No. 6 / 1998, <http://crimso.msk.ru>).



Missile K-7L under the wing of Yak-25K (Gordon E. Large family. // Aviation and Time. No. 6 / 1997, <http://crimso.msk.ru>).

Author: [DIMMI](#)

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